

HIGH VOLTAGE H.R.C. FUSE-LINKS



3.3 kV
5-200 250
AMP MVA



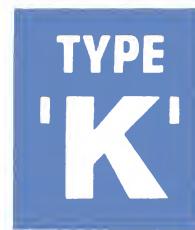
11 kV
5-100 750
AMP MVA

'ENGLISH ELECTRIC'

'ENGLISH ELECTRIC'

HIGH VOLTAGE H.R.C. FUSE-LINKS

(PATENTS PENDING)



TO B.S. 2692 : 1956

Intensive research and testing, based on more than thirty-five years of experience as the World's leading manufacturer of medium voltage H.R.C. fuse-links, have enabled 'English Electric' to introduce High Voltage fuse-links possessing equally high standards of design, quality and performance.

Strict quality control throughout manufacture guarantees these high standards and ensures complete uniformity of product.

This publication gives details of the ranges available and each rating of fuse-link is listed together with ordering references, dimensions and characteristic curves.

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APPLICATION

There are two complete ranges of Type 'K' fuse-links available for service up to and including 11 kV, both of which are fully tested and ASTA certified to B.S.2692:1956:—

3·3 kV 150 MVA with current ratings 5 to 200 amp

11 kV 250 MVA with current ratings 5 to 100 amp

ASTA certificates of rating are issued only in respect of British Standard ratings and the above short-circuit ratings correspond to the highest categories specified in B.S.2692:1956.

Additional tests, in accordance with the provisions of B.S.2692, have been carried out successfully to prove the 3·3 kV fuse-link to 250 MVA and the 11 kV fuse-link to 750 MVA.

Arc voltages produced during operation are appreciably below the values given in B.S.2692 on rated voltages, and also on 2·2 kV in the case of 3·3 kV fuse-links and on 6·6 kV for 11 kV fuse-links.

The 3·3 kV fuse-links are suitable for use in air, with or without striker pin operation, and are provided with off-set tags for bolted connections.

The 11 kV fuse-links are suitable for use in air, with or without striker pin operation, and fitted with ferrule type contacts or off-set tags. A limited range for use in oil, primarily intended for replacement purposes, is also available.

Variations to type and size of tag assemblies can be arranged to suit special requirements, and indoor fuse mounts are available (see dimensional drawings on page 10). Motor starting is particularly catered for, with time/current characteristics designed to give a high current withstand during the starting period.

These fuse-links will operate successfully in parallel, enabling circuits requiring fuses in excess of 200 amp at 3·3 kV and in excess of 100 amp at 11 kV to be catered for. Details on application.

QUALITY CONTROL

Every user will appreciate, that by its very nature of duty, protective equipment must incorporate the highest degree of quality to ensure long life to expensive apparatus and minimise shut-down of plant. This responsibility to industry has always been paramount in 'English Electric' throughout their unrivalled experience in H.R.C. fuse manufacture, and is evident in the manufacturing control on High Voltage fuses, and also in the choice of designs selected to ensure the coolest running under normal load conditions.

Individual elements are fabricated from pure silver and are carefully examined during manufacture of the fuse-links. All the 11 kV elements, and the higher ratings in the 3-3 kV range, are supported on star cores, or formers, and located at each end. The overall electrical resistance is checked by means of an ohmic test and each element assembly is inserted into a ceramic body which is then filled with pure granulated quartz. Silver plated copper ferrules are sealed to each end of the fuse body.

Due to the more intricate construction of the 11 kV fuse-links additional safety measures are taken as upon completion, each is carefully examined by radiograph. The radiograph is marked with the relevant serial number of the fuse and these records are available for inspection at any time.

After radiographing, each fuse-link is again tested for correct ohmic resistance, and in addition to the above, all fuses for use in oil are subjected to a searching hot water test to prove the efficiency of the oil seal. This is a routine test for each fuse, and is additional to the normal type tests laid down in B.S.2692:1956.

Considerable care is taken in the packing and storage of the fuse-links as, on completion of manufacture, each fuse-link is sealed in a transparent P.V.C. envelope to give protection to current-carrying parts whilst in storage and further protection is given by enclosure in a strong outer carton.

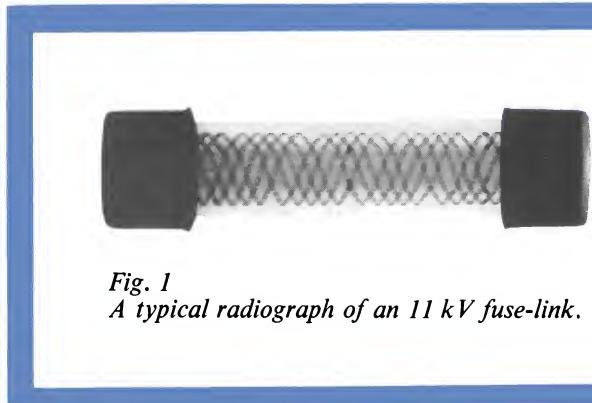


Fig. 1
A typical radiograph of an 11 kV fuse-link.

Fig. 2
Completed 11 kV fuse-links being given a routine check for correct resistance.



Fig. 3 General view of one of the control rooms at the Nelson High Power Laboratory, Stafford, where short-circuit testing of High Voltage fuse-links is carried out.

Fig. 4 General view of part of Fusegear Division Test Laboratory at Liverpool, taken while tests on High Voltage fuse-links were in progress.



3·3 kV HIGH VOLTAGE H.R.C.

LIST NUMBERS FOR ORDERING PURPOSES TAG CONTACTS

TYPE
K2PA



TYPES
K3PB
& K3PBX

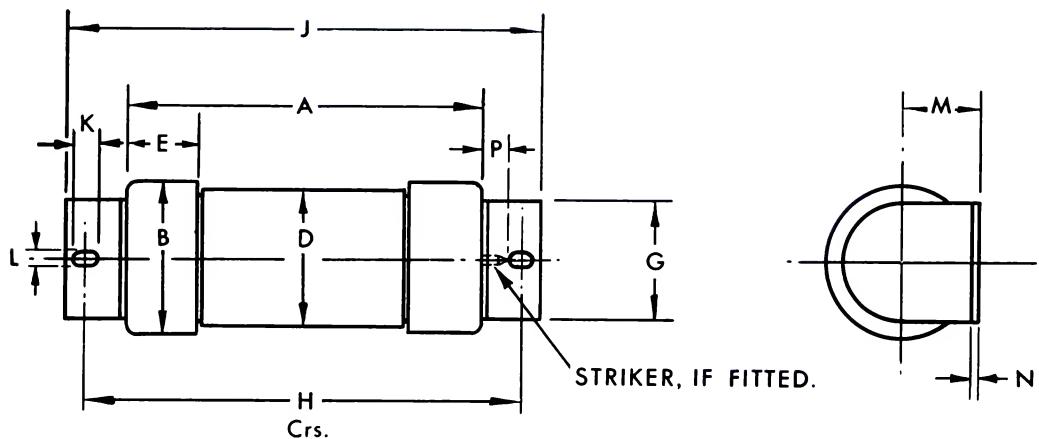


TYPES
K4PC
& K4PCX

Rating Amp	List No.	
	With Striker	Without Striker
5	K3PBX5A	K2PA5A
10	K3PBX10A	K2PA10A
15	K3PBX15A	K2PA15A
20	K3PBX20A	K2PA20A
25	K3PBX25A	K2PA25A
30	K3PBX30A	K2PA30A
40	K3PBX40A	K2PA40A
50	K3PBX50A	K2PA50A
60	K3PBX60A	K3PB60A
75	K3PBX75A	K3PB75A
100	K3PBX100A	K3PB100A
150	K4PCX150A	K4PC150A
200	K4PCX200A	K4PC200A

FUSE-LINKS — FOR USE IN AIR

DIMENSIONS IN INCHES



List No. Prefix	Rating Amp	A	B	D	E	G	H	J	K	L	M	N	P
K2PA (without striker)	5, 10, 15, 20 25, 30, 40, 50	$7\frac{1}{2}$ ($\pm\frac{1}{16}$)	$1\frac{3}{4}$	$1\frac{17}{32}$	$\frac{53}{64}$	$1\frac{1}{4}$	$9\frac{1}{4}$	$10\frac{1}{8}$ ($\pm\frac{1}{16}$)	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{1}{16}$	—
K3PBX (with striker)	5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 100	$7\frac{1}{2}$ ($\pm\frac{1}{16}$)	$2\frac{1}{16}$	2	$1\frac{9}{16}$	$1\frac{3}{4}$	$9\frac{1}{4}$	$10\frac{1}{8}$ ($\pm\frac{1}{16}$)	$\frac{1}{2}$	$\frac{3}{8}$	$1\frac{1}{8}$	$\frac{1}{8}$	$\frac{5}{16}$
K3PB (without striker)	60, 75, 100	$7\frac{1}{2}$ ($\pm\frac{1}{16}$)	$3\frac{1}{8}$	$3\frac{7}{32}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$9\frac{1}{4}$	$10\frac{1}{8}$ ($\pm\frac{1}{16}$)	$\frac{1}{2}$	$\frac{3}{8}$	$1\frac{5}{8}$	$\frac{1}{8}$	$\frac{5}{16}$ max.
K4PCX (with striker)	150, 200	$7\frac{1}{2}$ ($\pm\frac{1}{16}$)											
K4PC (without striker)													

11 kV HIGH VOLTAGE H.R.C.

**TYPES
KEB & KEBX**
(TYPES KEBO & KEBXO
FOR USE IN OIL)



**TYPES
KEA & KEAX**



LIST NUMBERS FOR ORDERING PURPOSES FERRULE CONTACTS

For use in AIR For use in AIR For use in OIL

14 $\frac{1}{8}$ " LONG			10" LONG			10" LONG		
Rating Amp	List No.		Rating Amp	List No.		Rating Amp	List No.	
	With Striker	Without Striker		With Striker	Without Striker		With Striker	Without Striker
5	KEAX5A	KEA5A	5	KEBX5A	KEB5A	5	KEBXO5A	KEBO5A
10	KEAX10A	KEA10A	10	KEBX10A	KEB10A	10	KEBXO10A	KEBO10A
15	KEAX15A	KEA15A	15	KEBX15A	KEB15A	15	KEBXO15A	KEBO15A
20	KEAX20A	KEA20A	20	KEBX20A	KEB20A	20	KEBXO20A	KEBO20A
25	KEAX25A	KEA25A	25	KEBX25A	KEB25A	25	KEBXO25A	KEBO25A
30	KEAX30A	KEA30A	30	KEBX30A	KEB30A	30	KEBXO30A	KEBO30A
40	KEAX40A	KEA40A	40	KEBX40A	KEB40A	40	KEBXO40A	KEBO40A
50	KEAX50A	KEA50A	50	KEBX50A	KEB50A	50	KEBXO50A	KEBO50A
60	KEAX60A	KEA60A				60	KEBXO60A	KEBO60A
75	KEAX75A	KEA75A						
100	KEAX100A	KEA100A						

TAG CONTACTS

For use in AIR

For use in AIR

16 $\frac{1}{4}$ " FIXING CENTRES		
Rating Amp	List No.	
	With Striker	Without Striker
5	K5EAX5A	K5EA5A
10	K5EAX10A	K5EA10A
15	K5EAX15A	K5EA15A
20	K5EAX20A	K5EA20A
25	K5EAX25A	K5EA25A
30	K5EAX30A	K5EA30A
40	K5EAX40A	K5EA40A
50	K5EAX50A	K5EA50A
60	K5EAX60A	K5EA60A
75	K5EAX75A	K5EA75A
100	K5EAX100A	K5EA100A

12 $\frac{1}{8}$ " FIXING CENTRES

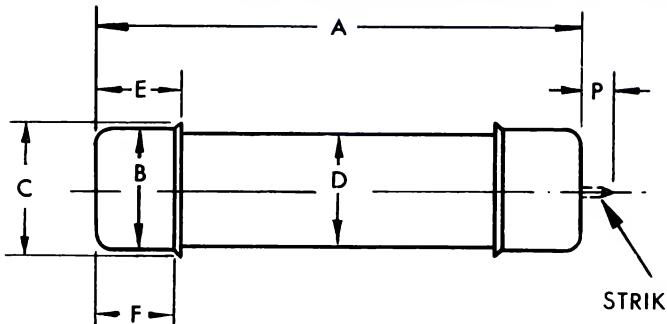
Rating Amp	List No.	
	With Striker	Without Striker
5	K6EBX5A	K6EB5A
10	K6EBX10A	K6EB10A
15	K6EBX15A	K6EB15A
20	K6EBX20A	K6EB20A
25	K6EBX25A	K6EB25A
30	K6EBX30A	K6EB30A
40	K6EBX40A	K6EB40A
50	K6EBX50A	K6EB50A

FUSE-LINKS

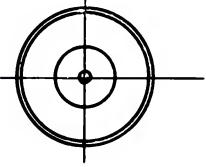
FOR USE IN AIR

(EXCEPT TYPES KEBO & KEBXO
(WHICH ARE SUITABLE FOR USE IN OIL))

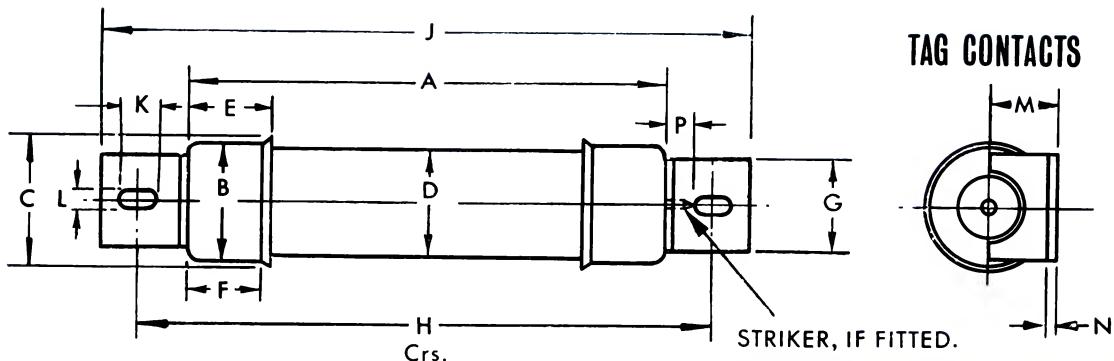
DIMENSIONS IN INCHES



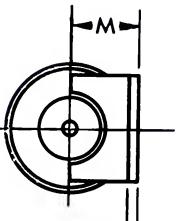
FERRULE CONTACTS



List No. Prefix	Rating Amp	A	B	C	D	E	F	P
KEAX (with striker) KEA (without striker)	5, 10, 15, 20 25, 30, 40, 50 60, 75, 100	14 $\frac{1}{8}$ ($\pm \frac{1}{16}$)	3	3 $\frac{1}{8}$	2 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{9}{16}$	$\frac{5}{8}$ max.
KEBX (with striker) KEB (without striker)	5, 10, 15, 20 25, 30, 40, 50	10 ($\pm \frac{1}{16}$)	2 $\frac{1}{2}$	2 $\frac{5}{8}$	2 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{9}{16}$	$\frac{5}{8}$ max.
For use in oil: KEBxo (with striker) KEBo (without striker)	5, 10, 15 20, 25, 30 40, 50, 60	10 ($\pm \frac{1}{16}$)	2 $\frac{1}{2}$	2 $\frac{5}{8}$	2 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{9}{16}$	$\frac{5}{8}$ max.



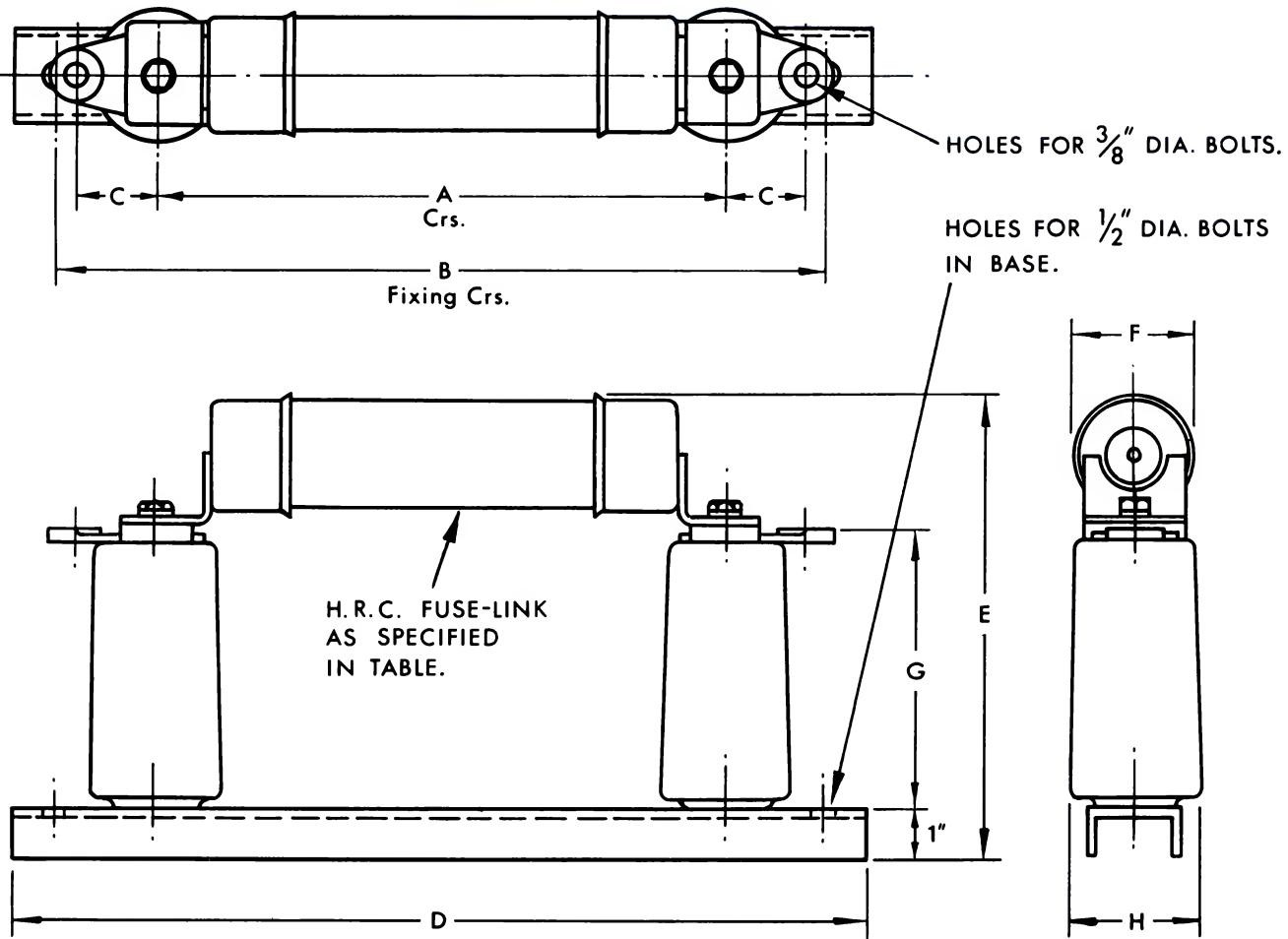
TAG CONTACTS



List No. Prefix	Rating Amp	A	B	C	D	E	F	G	H	J	K	L	M	N	P
K5EAX (with striker) K5EA (without striker)	5, 10, 15, 20 25, 30, 40, 50 60, 75, 100	14 $\frac{1}{8}$ ($\pm \frac{1}{16}$)	3	3 $\frac{1}{8}$	2 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{9}{16}$	2 $\frac{1}{4}$	16 $\frac{1}{4}$	17 $\frac{3}{4}$ ($\pm \frac{1}{16}$)	$\frac{1}{8}$	$\frac{7}{16}$	1 $\frac{1}{16}$	$\frac{1}{8}$	$\frac{5}{8}$ max.
K6EBX (with striker) K6EB (without striker)	5, 10, 15, 20 25, 30, 40, 50	10 ($\pm \frac{1}{16}$)	2 $\frac{1}{2}$	2 $\frac{5}{8}$	2 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{9}{16}$	2 $\frac{1}{4}$	12 $\frac{1}{8}$	13 $\frac{5}{8}$ ($\pm \frac{1}{16}$)	$\frac{1}{8}$	$\frac{7}{16}$	1 $\frac{7}{16}$	$\frac{1}{8}$	$\frac{5}{8}$ max.

INDOOR FUSE MOUNTS

DIMENSIONS IN INCHES



VOLTAGE	FUSE MOUNT ORDERING REF.	FOR USE WITH FUSE-LINKS TYPE	A	B	C	D	E	F	G	H
3.3 kV	P76313-30	K2PA	9 $\frac{1}{4}$	13 $\frac{1}{2}$	1 $\frac{1}{6}$	15 $\frac{1}{2}$	5 $\frac{5}{64}$	1 $\frac{37}{64}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$
		K3PB, K3PBX	9 $\frac{1}{4}$	13 $\frac{1}{2}$	1 $\frac{1}{6}$	15 $\frac{1}{2}$	6 $\frac{9}{32}$	2 $\frac{15}{16}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$
		K4PC, K4PCX	9 $\frac{1}{4}$	13 $\frac{1}{2}$	1 $\frac{1}{6}$	15 $\frac{1}{2}$	7 $\frac{5}{16}$	3 $\frac{1}{8}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$
11 kV	P76313-20	K5EA, K5EAX	16 $\frac{1}{4}$	20 $\frac{1}{2}$	1 $\frac{1}{6}$	22 $\frac{1}{2}$	10 $\frac{3}{16}$	3 $\frac{1}{8}$	5 $\frac{1}{8}$	2 $\frac{3}{4}$
	P76313-10	K6EB, K6EBX	12 $\frac{1}{8}$	16 $\frac{3}{8}$	1 $\frac{1}{6}$	18 $\frac{3}{8}$	9 $\frac{11}{16}$	2 $\frac{5}{8}$	5 $\frac{1}{8}$	2 $\frac{3}{4}$

CHARACTERISTIC CURVES

INDEX OF CHARACTERISTIC CURVES SHOWN ON PAGES 12-19
For further information please refer to 'English Electric', Fusegear Division, Liverpool.

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11 kV H.R.C. FUSE-LINKS (14½" BODY)	
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11 kV H.R.C. FUSE-LINKS (10" BODY)	
Time/Prospective Current	16
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11 kV H.R.C. FUSE-LINKS (10" BODY—FOR USE IN OIL)	
Time/Prospective Current	18
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DERIVATION OF LIST NUMBERS

FIRST LETTER: This is always 'K' and denotes the type reference for high voltage H.R.C. fuse-links listed in this publication.

SECOND LETTER: Denotes voltage rating: 'P'=3·3 kV, 'E'=11 kV.

SECOND & THIRD IN COMBINATION: Denotes dimensions of fuse body and manufacturing specification.

FOURTH LETTER (When used): Can be 'X' or 'O'. 'X'=Striker pin fitted; 'O'=For use in Oil.

FIFTH LETTER (When used): Will always be 'O' and denotes for use in Oil.

FINAL LETTER: This is always 'A' and denotes 'Amperes'.

NUMBERS

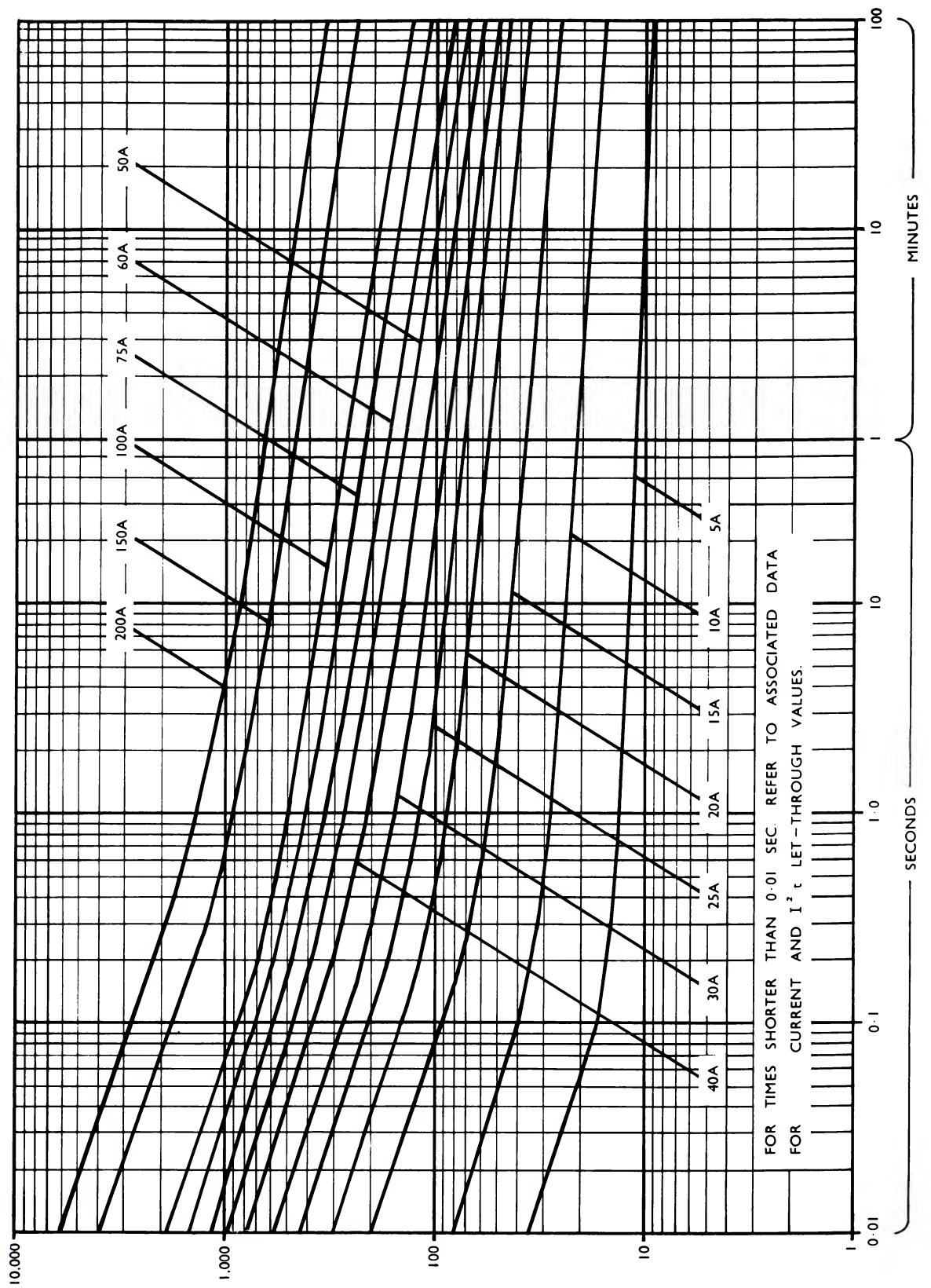
- If a number appears immediately after the prefix letter 'K' the fuse-link is fitted with tag contacts to a design represented by the number. Otherwise ferrule contacts are fitted.
- The number immediately preceding the final letter 'A' denotes the current rating of the fuse-link in amperes.

EXAMPLES

K5EAX100A Denotes a tag contact (5) fuse-link of 11 kV rating (E) with body dimensions (EA), fitted with striker pin (X) and of 100A rating.

KEBO60A Denotes a ferrule contact fuse-link of 11 kV rating (E) with body dimensions (EB) for use in oil (O) and of 60A rating.

TIME/CURRENT CHARACTERISTICS • 3.3 KV TYPES K2PA, K3PB, K3PBX, K4PC, K4PCX • FOR USE IN AIR

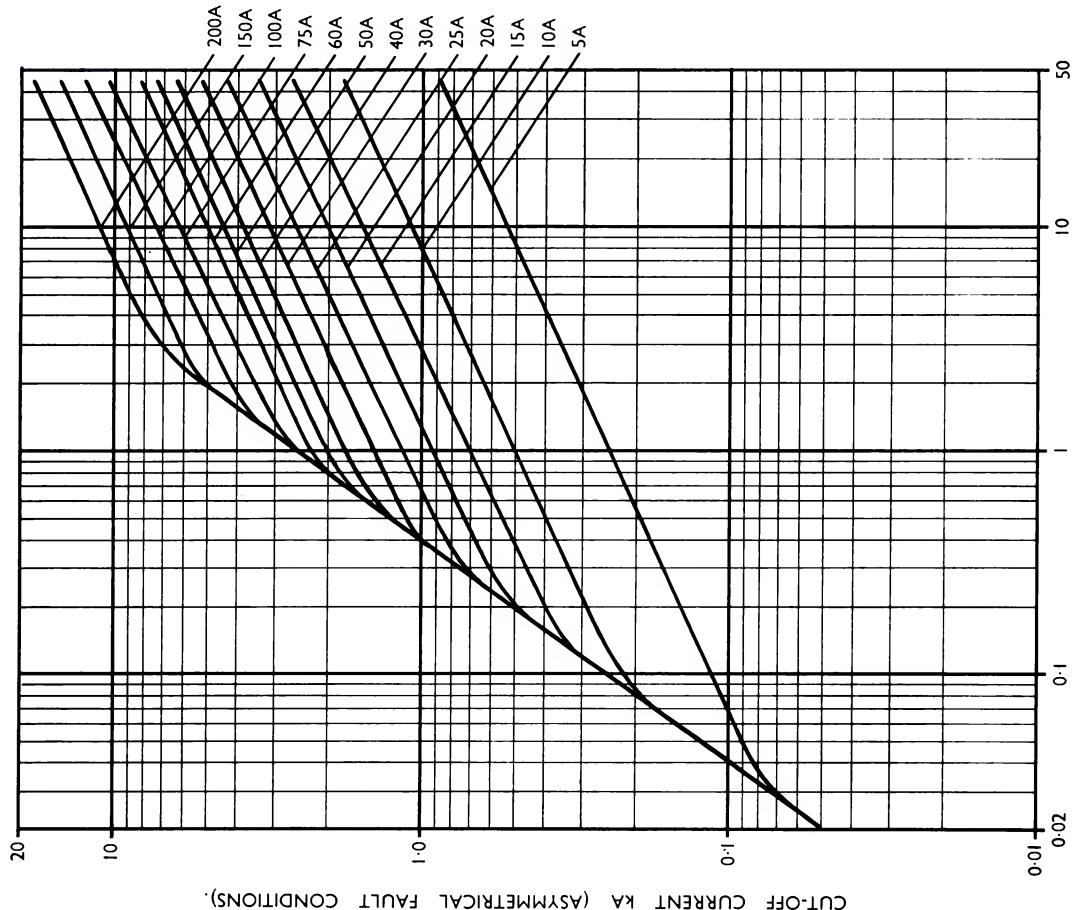


F.G.D./X272/212/A

CUT-OFF CURRENT CHARACTERISTICS

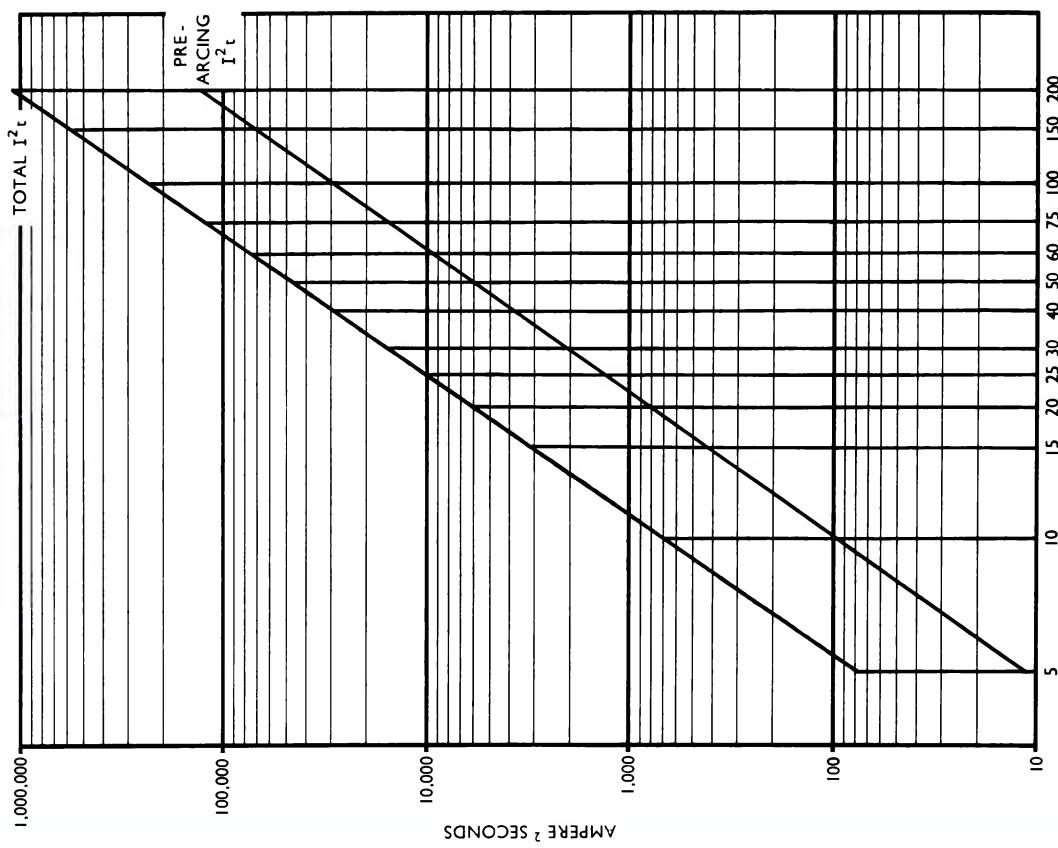
At Prospective currents up to 43.8 kA at 3.3 kV

TYPES K2PA, K3PB, K3PBX, K4PC, K4PCX • FOR USE IN AIR

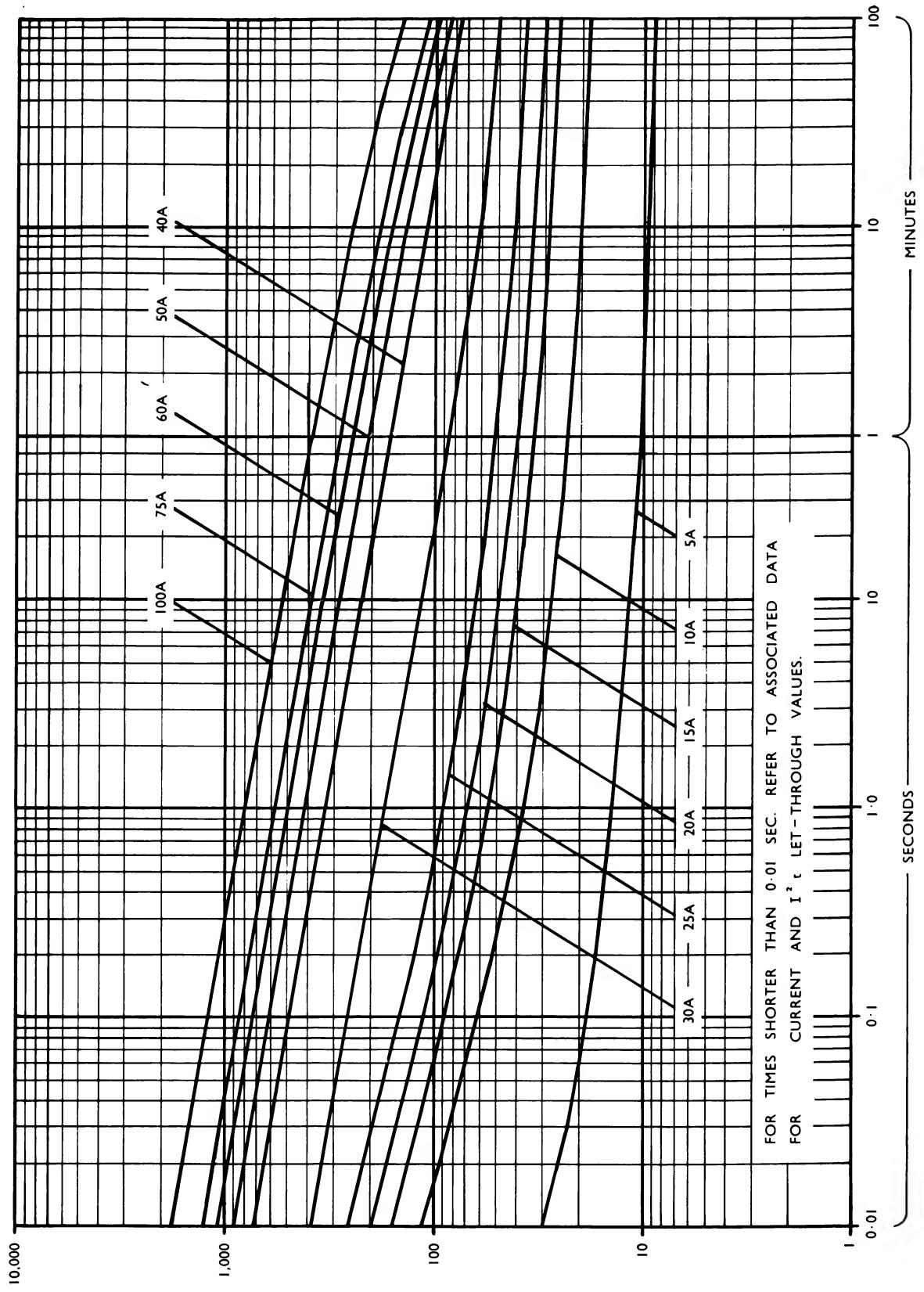


MAXIMUM VALUES of I^2t at 3.3 kV

TYPES K2PA, K3PB, K3PBX, K4PC, K4PCX • FOR USE IN AIR



TIME/CURRENT CHARACTERISTICS • 11 KV TYPES KEA, KEAX, K5EA, K5EAX • FOR USE IN AIR

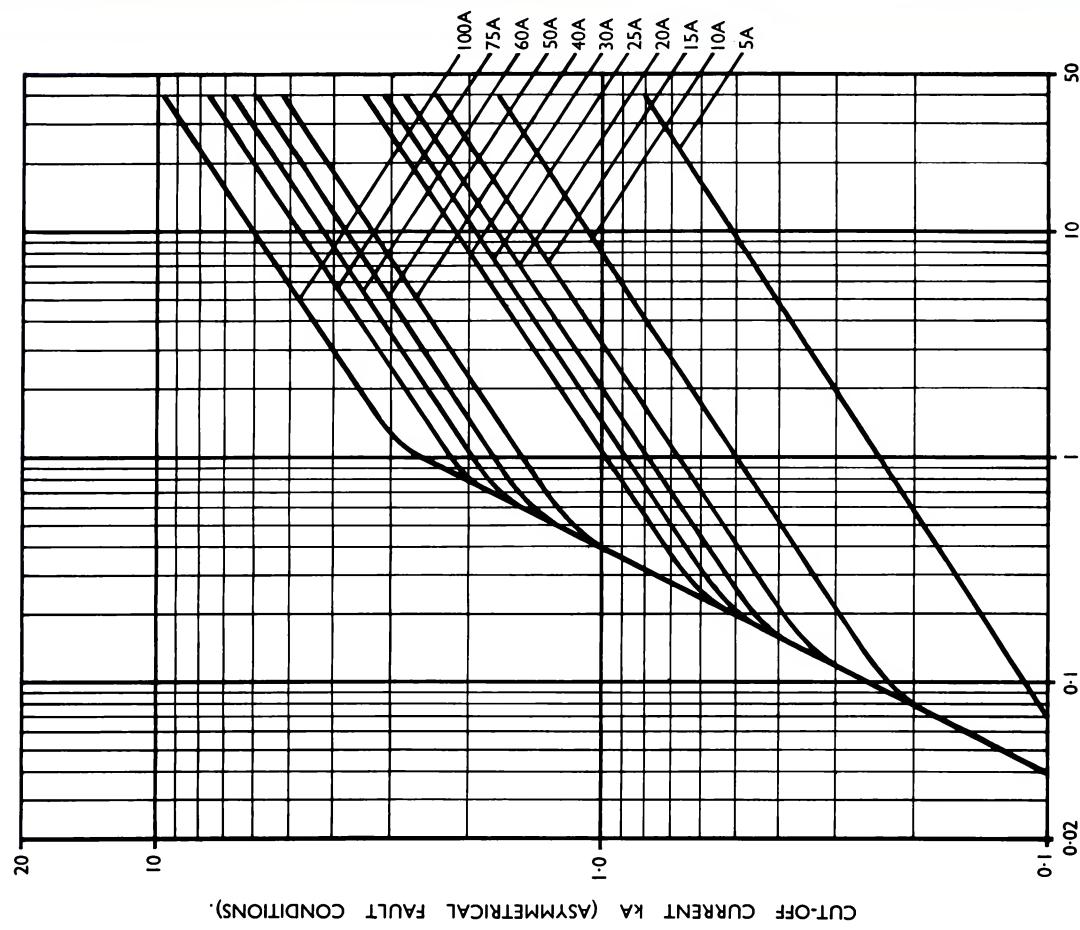


R.M.S. SYMMETRICAL PROSPECTIVE CURRENT IN AMPERES

CUT-OFF CURRENT CHARACTERISTICS

At Prospective currents up to 39.4 kA at 11 kV

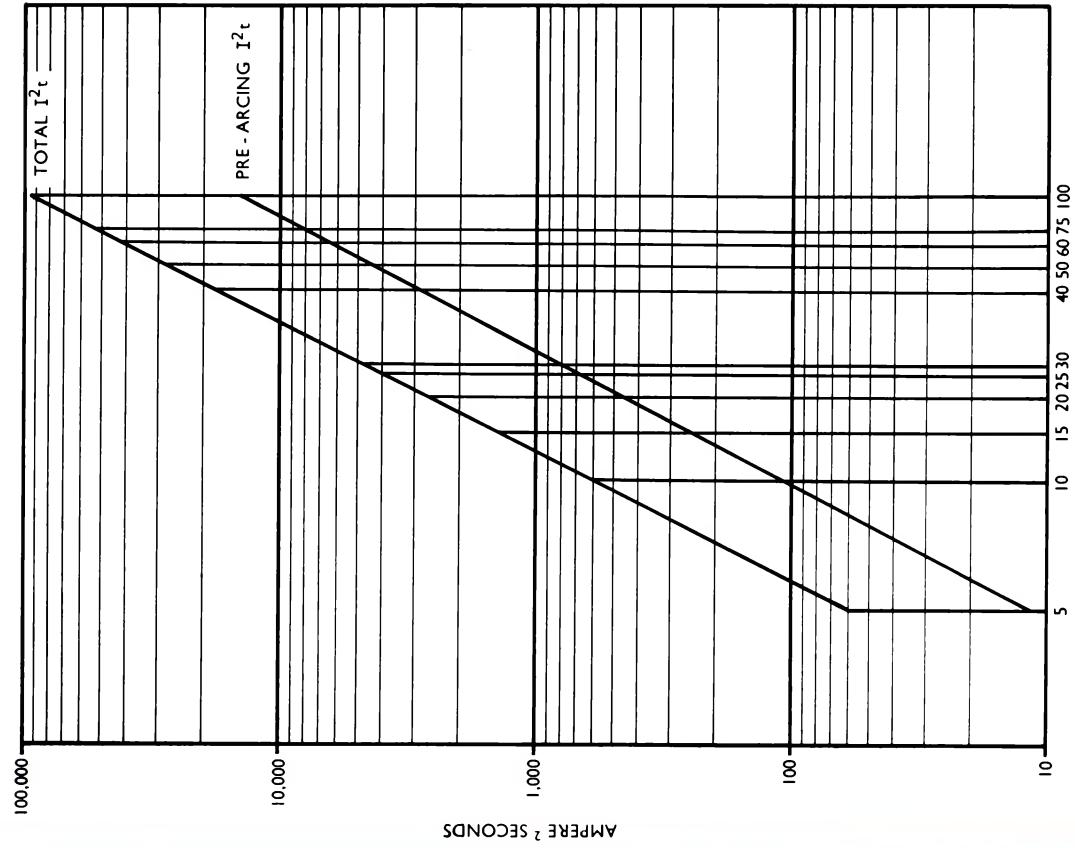
TYPES KEA, K5EA, K5EAX · FOR USE IN AIR



F.G.D./X1388/D

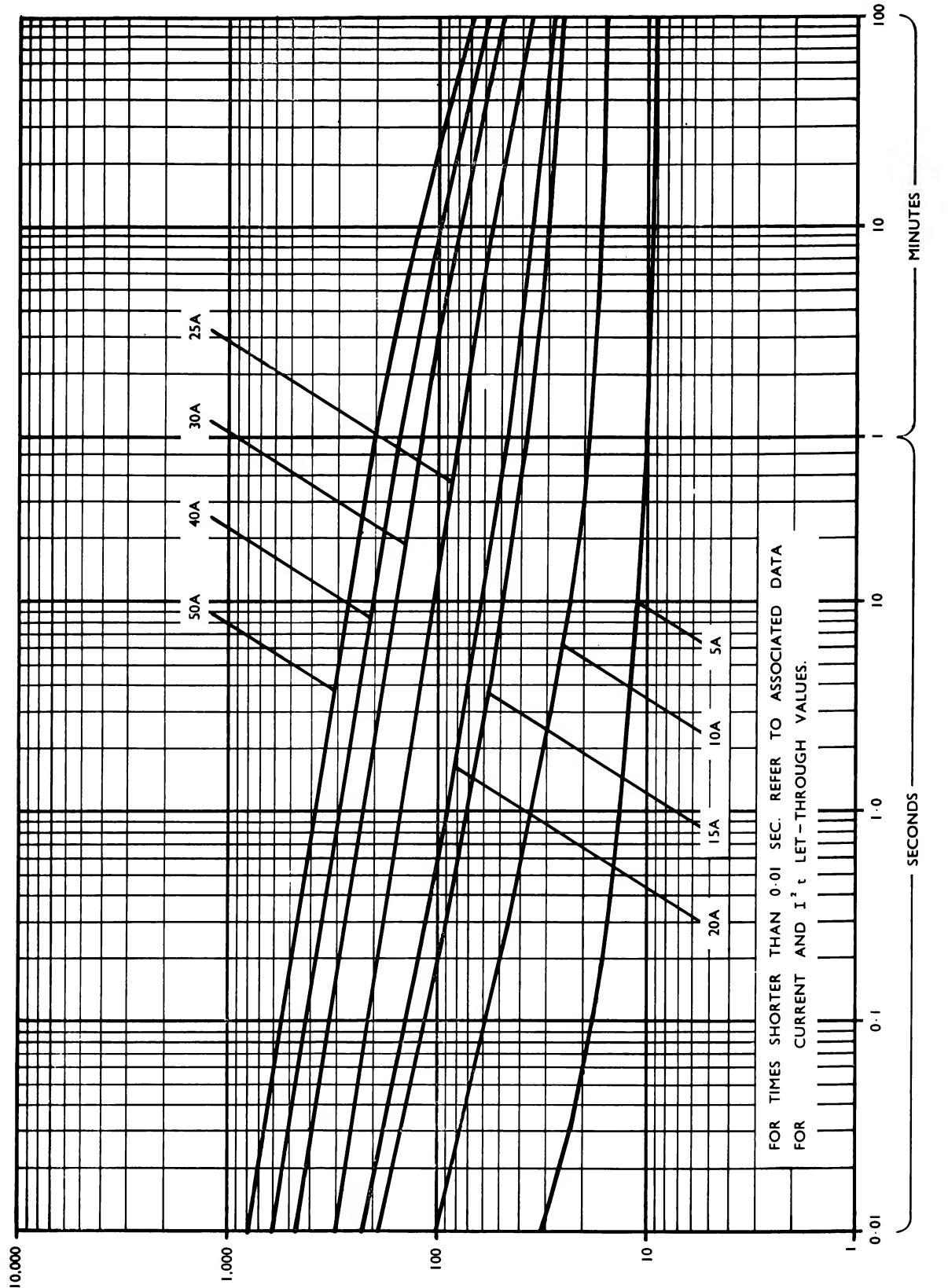
MAXIMUM VALUES of I^2t at 11 kV

TYPES KEA, K5EA, K5EAX · FOR USE IN AIR



F.G.D./X1440/A

TIME/CURRENT CHARACTERISTICS • 11 KV TYPES KEB, KEBX, K6EB, K6EBX • FOR USE IN AIR

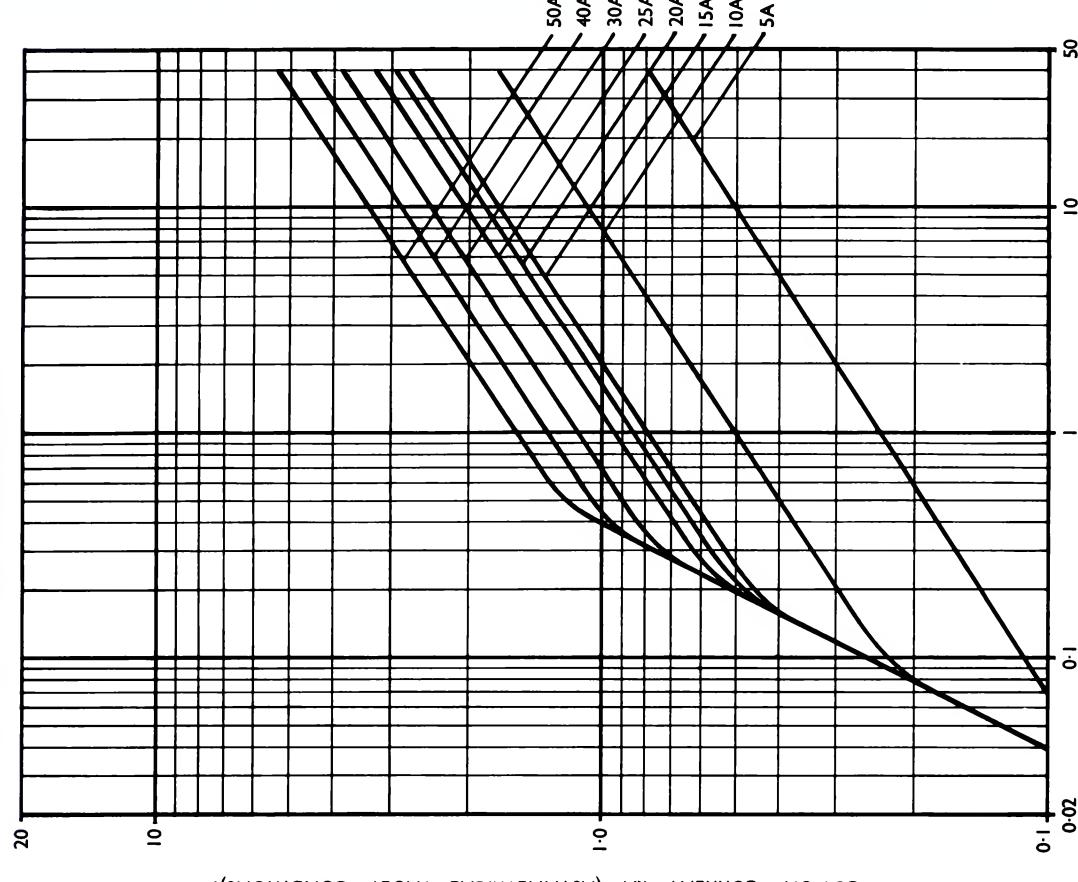


R.M.S. SYMMETRICAL PROSPECTIVE CURRENT IN AMPERES

CUT-OFF CURRENT CHARACTERISTICS

At Prospective currents up to 39.4 kA at 11 kV

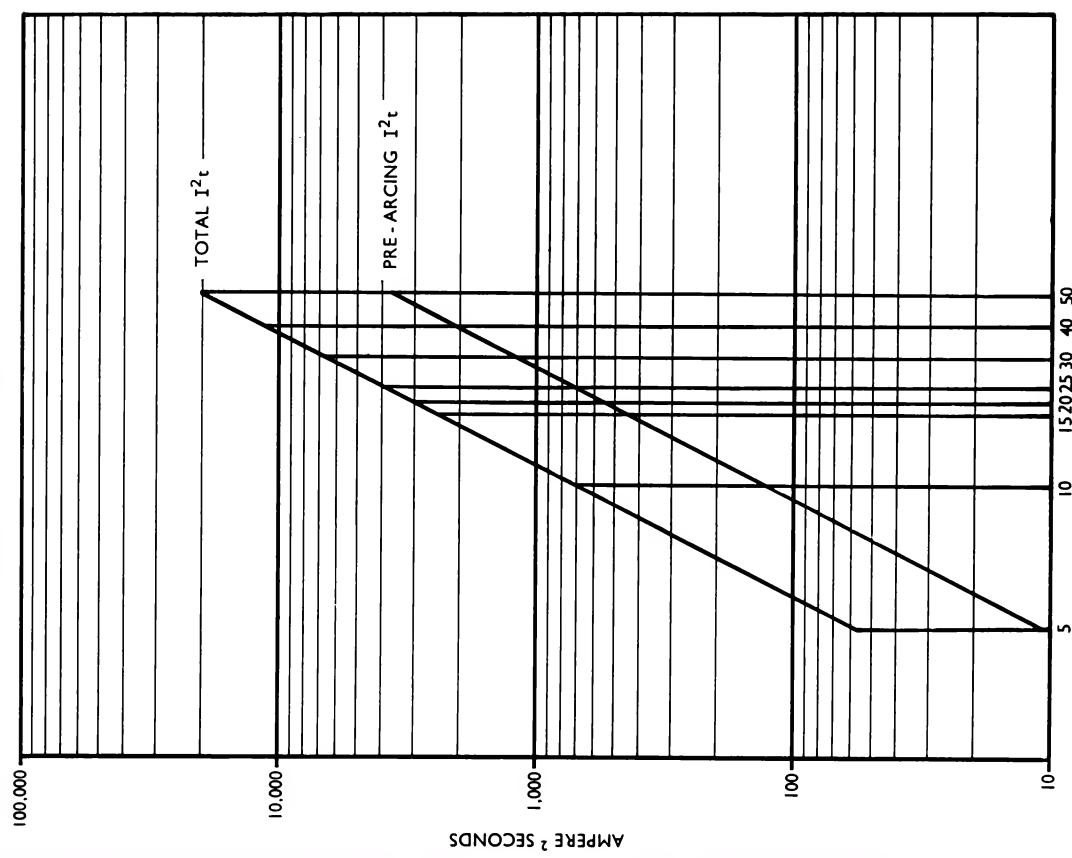
TYPES KEB, KEBX, K6EB, K6EBX · FOR USE IN AIR



CUT-OFF CURRENT kA (ASYMMETRICAL FAULT CONDITIONS).

F.G.D./X1390/C

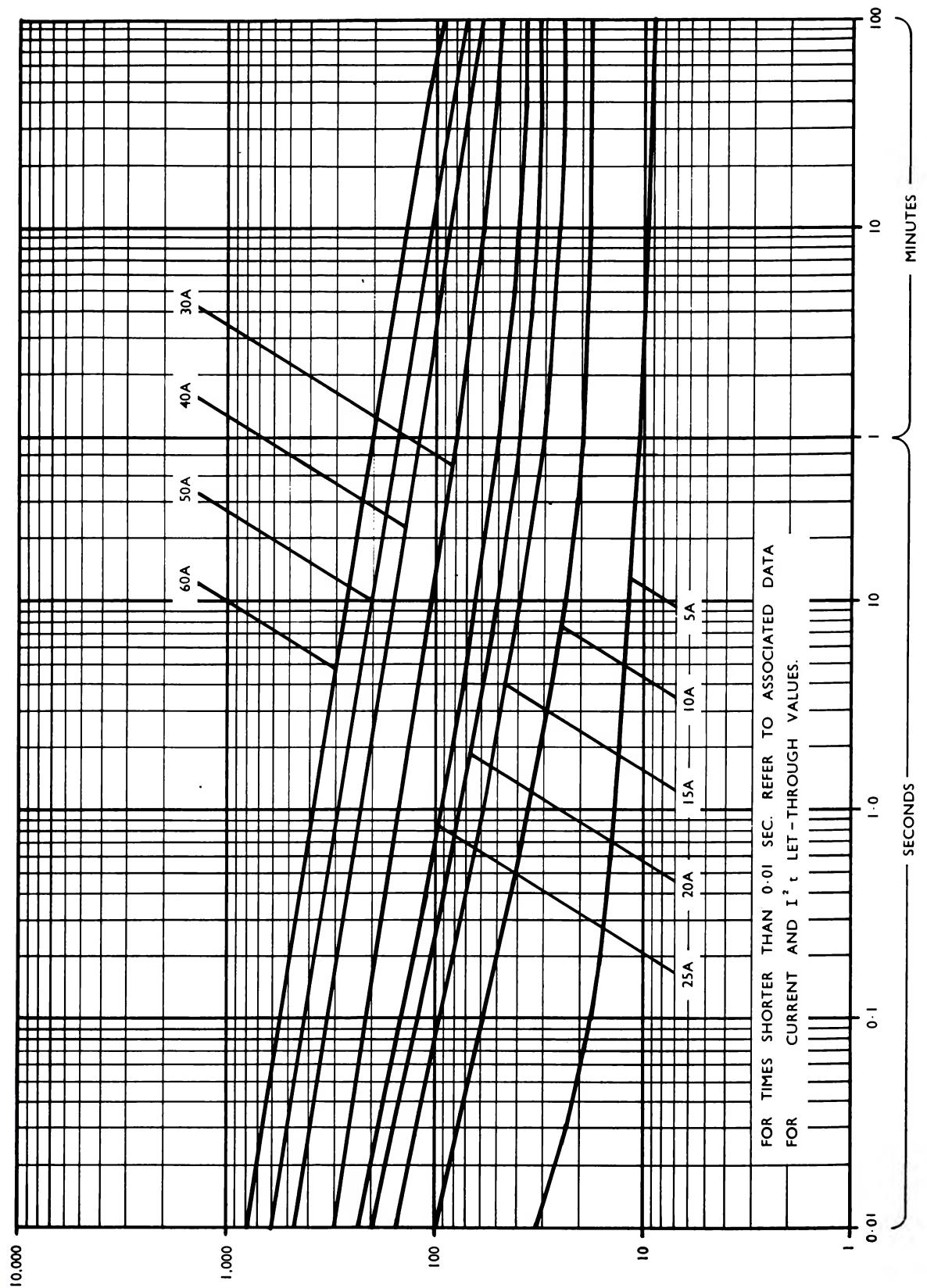
MAXIMUM VALUES of I^2t at 11 kV TYPES KEB, KEBX, K6EB, K6EBX · FOR USE IN AIR



FUSE RATING - AMPERES

F.G.D./X1439/A

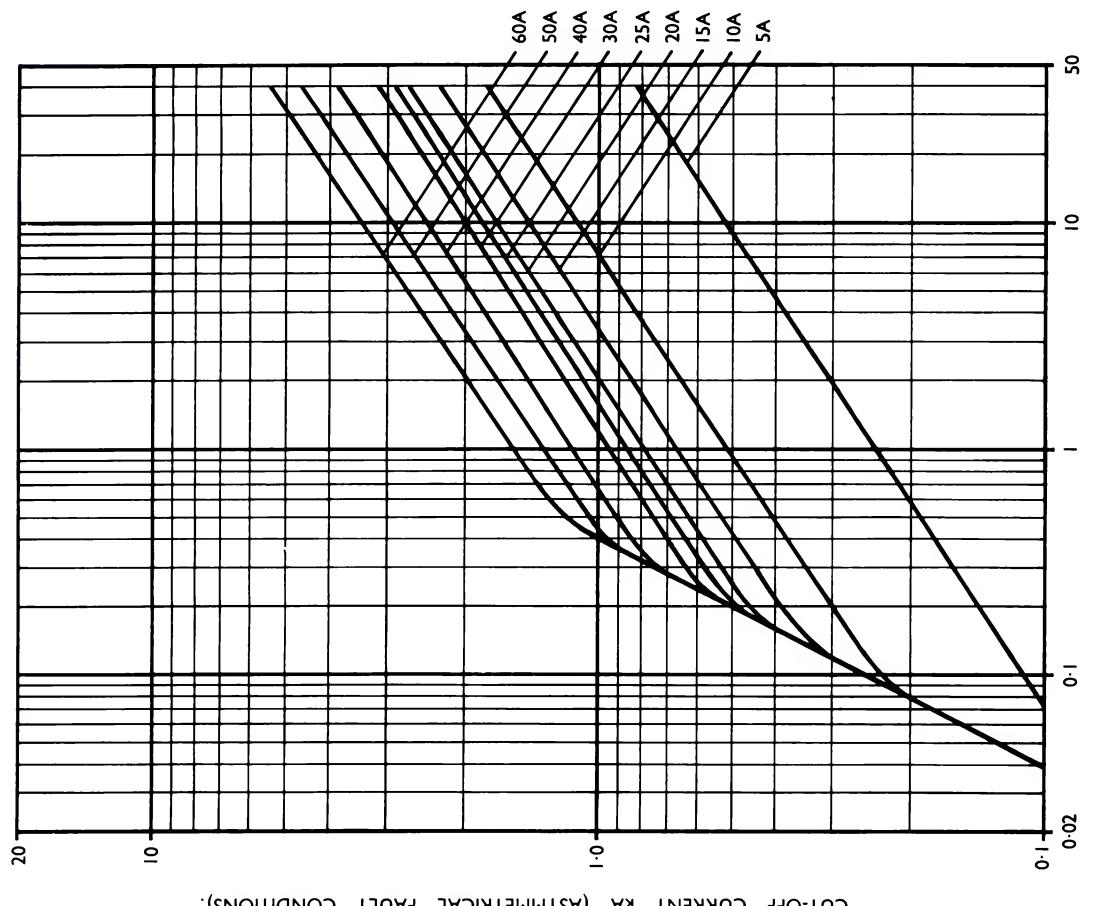
TIME/CURRENT CHARACTERISTICS • 11 KV TYPES KEB0, KEBX0 • FOR USE IN OIL



CUT-OFF CURRENT CHARACTERISTICS

At Prospective currents up to 39.4 kA at 11 kV

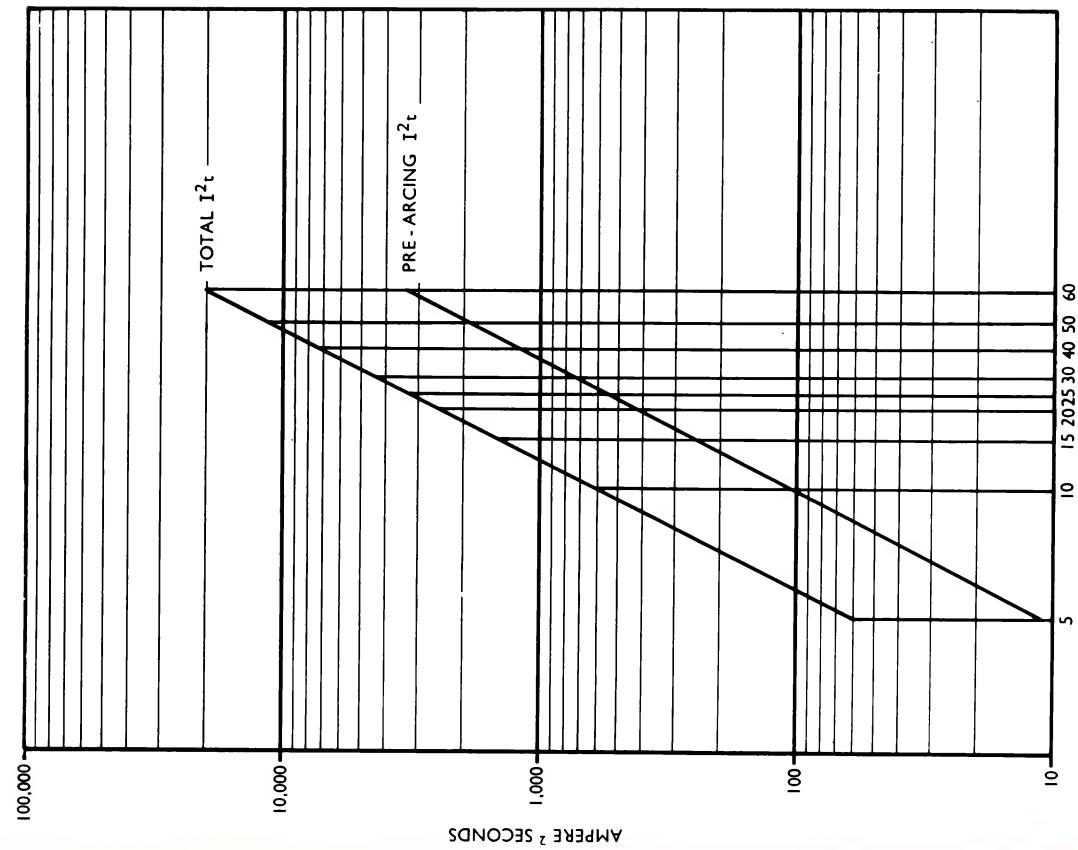
TYPES KEB0, KEBX0 · FOR USE IN OIL



F.G.D./X1389/C

MAXIMUM VALUES of I^2t at 11 kV

TYPES KEB0, KEBX0 · FOR USE IN OIL



F.G.D./X1438/A

In the
interests of
SAFETY
use
'ENGLISH ELECTRIC'
H.R.C.
Fuse-links

THE STANDARD OF QUALITY & PERFORMANCE THE WORLD OVER

NOTE: The Company's policy is one of continuous development and improvement of its products, and therefore, the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

'ENGLISH ELECTRIC'



FUSEGEAR DIVISION

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